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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/556,491	08/21/2006	Joseph P. Kennedy JR.	GRA26 019US	8445

7590 02/22/2008
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EXAMINER

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ART UNIT	PAPER NUMBER
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2618

MAIL DATE	DELIVERY MODE
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02/22/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/556,491

Applicant(s)

KENNEDY ET AL.

Examiner

Alejandro Rivero

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: location determining sensor 30 (line 6 of paragraph [0008] of the written description). The drawings are also objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: elements 30a, 30b and 30c of figure 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d), and/or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top

margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because the "Geolocation Control Systems" of figure 1 should be labeled "50" instead of "50b" (see last line of paragraph [0008] of written description). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

Paragraph [0001] makes reference to five related or co-pending applications by naming the titles but SN# is not provided for any of them.

In paragraph [0037] (line 1), the examiner respectfully suggests replacing "mobile'ss" with "mobile's".

In paragraph [0050] (line 6), the examiner respectfully suggests replacing "hearablility" with "hearability".

Appropriate correction is required.

Claim Objections

5. Claims 3, 9, 16 and 19 are objected to because of the following informalities:

In claim 3 (last line), the examiner respectfully suggests replacing "mobile" with "mobile appliance" in order to maintain uniformity throughout the claim since only a "mobile appliance" had been mentioned previously.

In claim 9 (line 3), the examiner respectfully suggests replacing "location a mobile" with "location of a mobile".

Claim 16 appears to be incomplete. It is unclear what is being claimed and a corresponding rejection under second paragraph 35 U.S.C. 112 is stated below.

In claim 19 (line 8), the examiner respectfully suggests replacing "hearablility" with "hearability".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4, 6, 16 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "substantially similar" (line 6), which renders the claim indefinite because it is unclear because "substantially" and "similar" are relative terms. The phrase "substantially similar" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention since the degree of similarity is not defined.

Claim 6 recites the limitation "the serving base station" in line 4. There is insufficient antecedent basis for this limitation in the claim. For the purpose of this examination claim 6 will be treated as reciting "a serving base station" instead of the aforementioned phrase.

Claim 16 is rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph. The claim is incomplete and indefinite since it is not clear what is the subject matter being claimed. The structure/step which goes to make up the device/method must be clearly and positively specified. The structure/step must be organized and correlated in such a manner as to present a complete operative device/method.

Claim 23 recites the limitations "the timing advance", "the Abis monitoring unit" and "the forward link transmission" in lines 21, 24 and 28, respectively. There is

insufficient antecedent basis for these limitations in the claim. For the purpose of this examination, claim 23 will be treated as reciting "a timing advance", "an Abis monitoring unit" and "a forward link transmission" instead of the aforementioned phrases, respectively.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 4, 6, 9, 10, 11, 15, 17, 19, 20, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Hawkes et al. (US 5,973,643).

Consider claim 1, Hawkes et al. disclose a wireless communication system having a plurality of base stations (column 2 lines 37-56, column 3 lines 14-25, column 4 lines 5-25, column 5 lines 7-49), for communication with one or more mobile appliances (column 2 lines 37-56, column 3 lines 14-25, column 4 lines 5-25, column 5 lines 7-49, where Hawkes et al. disclose emitters such as mobile cellular telephones), and a network overlay geo-location system having a plurality of wireless location sensors for providing location measurements (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25), comprising wherein one or more of the plurality of wireless location sensors are geographically separated from one or more of the plurality of base stations served by the one or more wireless location sensors (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39-

column 8 line 25, figures 1 and 7, where Hawkes et al. disclose, for example, mobile location sensors 19a, 19b and 19c in connection with base stations 2a, 2b and 2c are used to locate a mobile cellular telephone 1 and Hawkes et al. disclose that the base stations and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated from the two base stations to which it is not physically connected).

Consider claim 4, Hawkes et al. disclose in a wireless communication system having a base station in communication with a mobile appliance (column 2 lines 37-56, column 3 lines 14-25, column 4 lines 5-25, column 5 lines 7-49), a method of determining the location of the mobile appliance comprising providing a plurality of wireless location sensors geographically separated from said base station (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25, figures 1 and 7, where Hawkes et al. disclose, for example, mobile location sensors 19a, 19b and 19c in connection with base stations 2a, 2b and 2c are used to locate a mobile cellular telephone 1 and Hawkes et al. disclose that the base stations and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated from the two base stations to which it is not physically connected); and, independently configuring the plurality of wireless location sensors to provide a coverage area substantially similar to a coverage area of the wireless communication system (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25, figures 1 and 7, where Hawkes et al. disclose tasking individual mobile location sensors based on the capability of the tasked sensors

to intercept emitter signals from an area (coarse area) defined by the service area, hence similar to the coverage area).

Consider claim 6, Hawkes et al. disclose in a wireless communication system having a sparse (spaced out, at different locations) deployment of wireless location sensors wherein one or more base stations of the wireless communication system are not associated (physically connected) with a co-located wireless location sensor (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25, figures 1 and 7, where Hawkes et al. disclose, for example, mobile location sensors 19a, 19b and 19c in connection with base stations 2a, 2b and 2c are used to locate a mobile cellular telephone 1 and Hawkes et al. disclose that the base stations and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated from the two base stations to which it is not physically connected (not associated) and where Hawkes et al. disclose tasking individual groups of mobile location sensors based on their capability to intercept emitter signals from an area (the group is co-located) defined by the service area); a method of detecting and measuring an attribute of a target signal (column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 where Hawkes et al. disclose receiving at least signal strength data and TOA measurements of a signal) independently of a WLS co-located at a serving base station (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25, figures 1 and 7, where Hawkes et al. disclose mobile location sensors 19a, 19b and 19c (WLS) in connection with base stations 2a, 2b and 2c are used to locate a

mobile cellular telephone 1 and also disclose that the base stations and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated (independently) from the two base stations to which it is not physically connected) comprising: receiving the target signal in one or more neighboring WLS (column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 where Hawkes et al. disclose receiving at least signal strength data and TOA measurements of a signal) and performing ambiguity function processing using known data sequences in the target signal and the received target signal (column 20 line 66- column 21 line 21 where Hawkes et al. disclose resolving AOA ambiguities using known azimuths of the coarse geographical area).

Consider claim 9, Hawkes et al. disclose in a wireless communication system having a sparse (spaced out, at different locations) deployment of wireless location sensors wherein one or more base stations of the wireless communication system are not associated (physically connected) with a co-located wireless location sensor (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25, figures 1 and 7, where Hawkes et al. disclose, for example, mobile location sensors 19a, 19b and 19c in connection with base stations 2a, 2b and 2c are used to locate a mobile cellular telephone 1 and Hawkes et al. disclose that the base stations and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated from the two base stations to which it is not physically connected (not associated) and where Hawkes et al.

disclose tasking individual groups of mobile location sensors based on their capability to intercept emitter signals from an area (the group is co-located) defined by the service area); a method for estimating location a mobile appliance in a sparse (spaced out, at different locations) WLS deployment system wherein the number of WLS detecting and measuring an attribute of a signal of the mobile appliance is less than a predetermined number necessary for estimating a location (column 4 lines 26-44 where Hawkes et al. disclose a scenario where only two sensors are available instead of the three or more needed by a TOA location system, hence less than a predetermined necessary sensors at least for TOA location system), comprising: selecting one or more location surfaces (coarse area) determined as a function of one or more in the group comprising a timing advance of the signal, a relationship between the transmitted power of the signal and the received power of the signal, the speed of the mobile appliance and, a second signal transmitted to the mobile appliance in a frequency band different from the signal (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 where Hawkes et al. disclose using at least received signal measurements to determine a coarse area in which an emitter is located), and EOTD (time difference) data (column 10 line 38- column 11 line 19, column 12 line 66- column 13 line 50 where Hawkes et al. using time difference of arrival measurements and taking into account the relative time delay difference between two RF paths); and, estimating the location of the mobile appliance based on the measured attribute of the signal and the one or more location surfaces (column 2 lines

37-56, column 3 line 1- column 4 line 25, column 7 line 36- column 9 line 49, column 10 line 38- column 11 line 64).

Consider claims 10 and 11, Hawkes et al. disclose all the limitations as applied by claim 9 above and also disclose wherein the location surface determined as a function of the speed of the mobile appliance is defined by a high speed highway and the speed of the mobile appliance is determined by differential Doppler (column 19 line 40- column 20 line 25).

Consider claim 15, Hawkes et al. disclose all the limitations as applied to claim 9 above and also disclose wherein the selection is based on a predetermined criteria (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 7 line 36- column 9 line 49, column 10 line 38- column 11 line 64 where Hawkes et al. disclose using at least received signal measurements to determine a coarse area in which an emitter is located and determining, for example, the strength of received signals, hence predetermined criteria).

Consider claim 17, Hawkes et al. disclose in a wireless communication system having a sparse (spaced out, at different locations) deployment of wireless location sensors wherein one or more base stations of the wireless communication system are not associated (physically connected) with a co-located wireless location sensor (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25, figures 1 and 7, where Hawkes et al. disclose, for example, mobile location sensors 19a, 19b and 19c in connection with base stations 2a, 2b and 2c are used to locate a mobile cellular telephone 1 and Hawkes et al. disclose that the base stations

and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated from the two base stations to which it is not physically connected (not associated) and where Hawkes et al. disclose tasking individual groups of mobile location sensors based on their capability to intercept emitter signals from an area (the group is co-located) defined by the service area) and wherein a geographic area served by the wireless communication system has a no location area (column 4 lines 26-44 where Hawkes et al. disclose a scenario where only two sensors are available instead of the three or more needed by a TOA location system, hence no location can be made using TOA location system), a method of determining the location of a mobile appliance comprising determining if the mobile appliance is in the no location area (column 4 lines 26-44 where Hawkes et al. disclose a scenario where only two sensors are available instead of the three or more needed by a TOA location system to locate the cellular telephone, hence it has been determined to be in an area where no location can be made using TOA location system), and; using enhanced observed time difference EOTD to estimate the location of the mobile appliance (column 10 line 38- column 11 line 19, column 12 line 66- column 13 line 50 where Hawkes et al. using time difference of arrival measurements and taking into account the relative time delay difference between two RF paths); and, estimating the location of the mobile appliance based on the measured attribute of the signal and the one or more location surfaces (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 7 line 36- column 9 line 49, column 10 line 38- column 11 line 64).

Consider claim 19, Hawkes et al. disclose in a wireless communication system having a sparse (spaced out, at different locations) deployment of wireless location sensors wherein one or more base stations of the wireless communication system are not associated (physically connected) with a co-located wireless location sensor (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25, figures 1 and 7, where Hawkes et al. disclose, for example, mobile location sensors 19a, 19b and 19c in connection with base stations 2a, 2b and 2c are used to locate a mobile cellular telephone 1 and Hawkes et al. disclose that the base stations and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated from the two base stations to which it is not physically connected (not associated) and where Hawkes et al. disclose tasking individual groups of mobile location sensors based on their capability to intercept emitter signals from an area (the group is co-located) defined by the service area); a method for estimating location a mobile appliance in a sparse (spaced out, at different locations) WLS deployment system wherein the number of WLS detecting and measuring an attribute of a signal of the mobile appliance is less than a predetermined number necessary for estimating a location (column 4 lines 26-44 where Hawkes et al. disclose a scenario where only two sensors are available instead of the three or more needed by a TOA location system, hence less than a predetermined necessary sensors at least for TOA location system), comprising: obtaining a set of candidate measurement data selected from the group of signal strength, timing advance, cell site hearability, sector hearability, adjacent cell site power measurements, multi-path

signature and TOA measurements (column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 where Hawkes et al. disclose receiving at least signal strength data and TOA measurements); comparing the set of candidate measurement data with a set of predetermined measurement (specified tolerances) data (column 7 line 36- column 8 line 25 where Hawkes et al. disclose comparing signal measurements against specified tolerances and requesting a power level increase if signal is determined to be weak during the process of locating a cellular telephone); and determining the location of the mobile appliance based on the comparison (column 7 line 36- column 8 line 25).

Consider claim 20, Hawkes et al. disclose all the limitations as applied to claim 19 above and also disclose wherein the multi-path signature is a function of one or more of the group comprising power, delay, frequency and angle (column 17 line 20- column 18 line 30, column 23 lines 29-39).

Consider claims 21 and 22, Hawkes et al. disclose all the limitations as applied to claim 19 above and also disclose wherein the predetermined measurement (specified tolerances) data is empirical data and based on theoretical propagation data (column 7 line 36- column 8 line 25 where Hawkes et al. disclose comparing signal measurements against specified tolerances, and the specified tolerances have been set for the purpose of providing an improved location estimate, therefore the specified tolerances theoretically improve the location estimate (hence based on theoretical propagation data) and the specified tolerances is empirical data since it has been measured to be the appropriate value which leads to improvement of location estimate).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkes et al. in view of Duffett-Smith et al. (US 6,529,165 B1).

Consider claim 2, Hawkes et al. disclose all the limitations as applied to claim 1 above.

Hawkes et al. do not specify wherein the plurality of base stations is greater than the plurality of wireless location sensors.

Duffett-Smith et al. disclose wherein the plurality of base stations is greater than the plurality of wireless location sensors (column 3 lines 5-18, column 7 line 59- column 8 line 8 where Duffett-Smith et al. disclose a sparse coverage of LMUs (reads on WLSs) and using virtual LMUs in order to form a full network).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have a number of wireless location sensors less than the number of base stations (sparse LMU coverage) as taught by Duffett-Smith et al. in the method of Hawkes et al. since by using a virtual LMU (reads on wireless location sensor) it is possible to minimize the use of real LMUs (creating sparse LMU coverage) thus reducing the cost of setting up real LMUs and while maintaining accuracy of predicted position (as suggested by Duffett-Smith et al. in 3 lines 5-18, column 5 line 50- column 6 line 21, column 7 line 59- column 8 line 8, column 11 lines 14-21).

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkes et al. in view of Carlson et al. (US 2002/0128020 A1).

Consider claim 3, Hawkes et al. disclose in a geographic area served by a wireless communication system having a sparse (spaced out, at different locations) network overlay geo-location system in which a primary wireless location sensor associated with a serving base station provides information about a signal received from

a mobile appliance (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 column 12 line 66- column 13 line 50, column 22 line 31- column 24 line 67 where Hawkes et al. disclose using time difference of arrival measurements and taking into account coarse AOA data from two mobile location sensors to compute a coarse geographical area), a method of locating the mobile appliance independently from the primary wireless location sensor (column 2 line 37- column 4 line 25, column 6 line 39- column 9 line 49, column 10 line 38- column 11 line 64, figures 1 and 7 where Hawkes et al. disclose receiving at least signal strength data and TOA measurements of a signal and also disclose mobile location sensors 19a, 19b and 19c (WLS) in connection with base stations 2a, 2b and 2c are used to locate a mobile cellular telephone 1 and also disclose that the base stations and mobile location sensors are each at a different location, hence each of mobile location sensors 19a, 19b and 19c is geographically separated (independently from the two base stations to which it is not physically connected) comprising: performing ambiguity function processing using known data sequences in the signal and the signal received at the another wireless location sensor (column 20 line 66- column 21 line 21 where Hawkes et al. disclose resolving AOA ambiguities using known azimuths of the coarse geographical area); measuring an attribute of the signal at the another wireless location sensor (column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 where Hawkes et al. disclose receiving at least signal strength data and TOA measurements) and estimating the

location of the mobile based at least in part by measured attribute (column 7 line 36-column 8 line 25).

Hawkes et al. do not specify providing the information to another wireless location sensor as to enable the another wireless location sensors to measure an attribute of the signal.

Carlson et al. disclose providing information to another wireless location sensor as to enable the another wireless location sensors to measure an attribute of the signal (paragraphs [0011], [0015] and [0035]-[0037] where Carlson et al disclose a primary WLS providing, via GCS, reference information to be cross-correlated to WLSs participating in the geolocation process).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the information to another wireless location sensor for measuring an attribute of the signal as taught by Carlson et al. in the method of Hawkes et al. in order to efficiently and accurately locate a mobile station by parallel processing at the WLSs rather than the GCS and increase the speed of the location estimates without sacrificing accuracy (as suggested by Carlson et al. in paragraphs [0004], [0010]-[0015], [0035]-[0037]).

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkes et al. in view of Stilp et al. (US 6,334,059 B1).

Consider claim 5, Hawkes et al. disclose all the limitations as applied to claim 4 above and also disclose wherein one or more of the plurality of wireless location sensors are positioned at buildings (column 18 lines 23-29).

Hawkes et al. do not specify high elevations.

Stilp et al. disclose on rooftops (column 8 lines 61-66, where Stilp et al. disclose locating Signal Collection Systems SCS (reads on WLS) at building rooftops, hence high elevations).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to position wireless location sensors at high elevations such as rooftops as taught by Stilp et al. in the system of Hawkes et al. in order to improve reception of signals from GPS satellites containing information used to perform time synchronization, which is critical during the location process since measurements must be taken at the same time in order to ensure that the data collected comes from the same cellular telephone (as suggested by Stilp et al. in column 8 line 47- column 9 line 27 and as suggested by Hawkes et al. in column 12 line 66- column 13 line 16).

15. Claims 7, 8, 12, 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkes et al. in view of Anderson (US 2002/0039904 A1).

Consider claims 7, 12, 14 and 18, Hawkes et al. disclose all the limitations as applied to claims 6, 9 and 17 above and also disclose wherein retrieving the known data sequences in the target signal (column 20 line 66- column 21 line 21 where Hawkes et al. disclose resolving AOA ambiguities using known azimuths of the coarse geographical area), wherein the transmitted power of the signal is provided (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 where Hawkes et al. disclose using at least received signal measurements to determine a coarse area in which an emitter is

located) and wherein the EOTD data is provided (column 10 line 38- column 11 line 19, column 12 line 66- column 13 line 50 where Hawkes et al. using time difference of arrival measurements and taking into account the relative time delay difference between two RF paths).

Hawkes et al. do not specify receiving information from an Abis monitoring unit.

Anderson discloses receiving the information from an Abis monitoring unit (paragraphs [0017], [0059], [0231], [0357]-[0358], [0367], [0371]-[0396]).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to receive the information from an Abis monitoring unit as taught by Anderson in the methods of Hawkes et al. in order to non-invasively collect information concerning cell, frequency, and caller for purposes of directing the wireless location system to identify the calling party (indirectly), the called party (e.g., 911), and the TDMA/FDMA resource being used for a given call at any time and locate mobile phones, thus the wireless location system may not be required to independently detect and demodulate control channel messages from wireless transmitters and may obtain all necessary voice channel assignment information from these interfaces (as suggested by Anderson in paragraphs [0017], [0059], [0231]).

Consider claim 8, Hawkes et al. as modified by Anderson disclose all the limitations as applied to claim 7 above and also disclose wherein the known data sequences are predetermined training sequences (column 20 line 66- column 21 line 21 of Hawkes et al., where Hawkes et al. disclose resolving AOA ambiguities using known

azimuths of the coarse geographical area and paragraphs [0371]-[0379] of Anderson where Anderson discloses a channel request with a training sequence).

16. Claim 13 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkes et al. in view of Dunn et al. (US 5,600,706).

Consider claim 13, Hawkes et al. disclose all the limitations as applied to claim 9 above and also disclose considering propagation (column 12 lines 17-45, column 19 line 40- column 20 line 25).

Hawkes et al. do not specify the propagation range of the second signal is greater than a propagation range of the signal.

Dunn et al. disclose using differences (hence greater/less than) in propagation ranges calculated to estimate location of mobile receivers (column 6 lines 40-63, column 9 lines 22-34, column 11 lines 23-42).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use comparison (greater/less than) of differences of propagation range as taught by Dunn et al. in the method of Hawkes et al. in order to use the results to estimate the location of a mobile receiver for services such as access, billing, emergencies, etc. (as suggested by Dunn et al. in column 1 lines 17-49, column 5 lines 13-32, column 6 lines 40-63, column 9 lines 22-34, column 11 lines 23-42 and as suggested by Hawkes et al. in column 3 lines 26-37).

17. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkes et al. in view of Carlson et al (US 2002/0128020 A1) and Duffett-Smith et al. (US 6,529,165 B1).

Consider claim 23, Hawkes et al. disclose in a wireless communication system having a set of base stations (column 2 lines 37-56, column 3 lines 14-25, column 4 lines 5-25, column 5 lines 7-49) for communication with a mobile appliance (column 2 lines 37-56, column 3 lines 14-25, column 4 lines 5-25, column 5 lines 7-49, where Hawkes et al. disclose emitters such as mobile cellular telephones), the set of base stations having a first subset of base stations having co-located wireless location sensors (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25), a method of locating a mobile appliance served by one base station in the set of base stations (column 2 line 37- column 4 line 25, column 5 lines 7-49, column 6 line 39- column 8 line 25) comprising: receiving a location request (column 7 line 36- column 8 line 25); in the one base station (having co-located WLS, first subset) receiving a signal from the mobile appliance at a primary wireless location sensor co-located with the one base station (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64 column 12 line 66- column 13 line 50, column 22 line 31- column 24 line 67); measuring an attribute of the signal at the primary and secondary wireless location sensors (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 8 line 52- column 9 line 49, column 10 line 38- column 11 line 64, column 12 line 66- column 13 line 50, column 22 line 31- column 24 line 67 where Hawkes et al. disclose strength data and TOA measurements); and determining a location for the mobile appliance based at least in part on the measured attributes (column 7 line 36- column 8 line 25). Hawkes et al. also disclose selecting one or more steps from the group comprising; performing ambiguity

function at the secondary wireless location sensors on known data sequences in the signal to detect signal and measure an attribute of the signal (column 20 line 66- column 21 line 21 where Hawkes et al. disclose resolving AOA ambiguities using known azimuths of the coarse geographical area), extracting the timing advance and determine a surface based on the timing advance; retrieving power measurements at the mobile appliance of adjacent cell from an Abis monitoring unit and form location surfaces from the power measurements; performing pattern matching to compare sets of measurement data with sets of predetermined data; performing pseudo-range measurements from timing signals transmitted in RF bands from the forward link transmission, wherein the RF bands are not the same as the signal and; using differential Doppler techniques and fading envelope detection techniques enabling known roadways to be used as surfaces of position for location (column 19 line 40- column 20 line 25); and determining the location of the mobile appliance based at least in part on the one or more steps (column 2 lines 37-56, column 3 line 1- column 4 line 25, column 7 line 36- column 9 line 49, column 10 line 38- column 11 line 64).

Hawkes et al. do not specify distributing information bits associated with the signal from the mobile appliances to secondary wireless location sensors to assist in acquiring the signal from the mobile appliance and wherein the one base station is a member of a subset of base stations without a co-located wireless location sensor.

Carlson et al. disclose providing information to another wireless location sensor as to enable the another wireless location sensors to measure an attribute of the signal (paragraphs [008]-[0011], [0015] and [0031]-[0037] where Carlson et al disclose a

primary WLS providing, via GCS, reference information to be cross-correlated to WLSs participating in the geolocation process).

Duffett-Smith et al. disclose wherein a base station is a member of a subset of base stations without a co-located wireless location sensor (column 3 lines 5-18, column 7 line 59- column 8 line 8 where Duffett-Smith et al. disclose a sparse coverage)

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the information to another wireless location sensor for measuring an attribute of the signal as taught by Carlson et al. in the method of Hawkes et al. and to have a number of wireless location sensors less than the number of base stations (sparse LMU coverage) as taught by Duffett-Smith et al. in the method of Hawkes et al. in order to efficiently and accurately locate a mobile station by parallel processing at the WLSs rather than the GCS and increase the speed of the location estimates without sacrificing accuracy and to minimize the use of real LMUs (creating sparse LMU coverage) thus reducing the cost of setting up real LMUs while maintaining accuracy of predicted position (as suggested by Carlson et al. in paragraphs [0004], [0010]-[0015], [0035]-[0037] and as suggested by Duffett-Smith et al. in 3 lines 5-18, column 5 line 50- column 6 line 21, column 7 line 59- column 8 line 8, column 11 lines 14-21).

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alejandro Rivero whose telephone number is 571-272-2839. The examiner can normally be reached on Monday-Friday. If attempts to

Application/Control Number:
10/556,491
Art Unit: 2618

Page 25

reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 571-272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AR


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